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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/945,247	08/31/2001	Seiichiro Higashi	9319T-000281	1294

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EXAMINER
SOWARD, IDA M

ART UNIT	PAPER NUMBER
2822	

DATE MAILED: 04/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/945,247	Applicant(s) HIGASHI ET AL.	
	Examiner Ida M Soward	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This Office Action is in response to Applicants' remarks filed March 3, 2003.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 5-8 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. (5,970,384) in view of Grill et al. (US 2002/0037442 A1) and Yamazaki et al. (US 2002/0034863 A1).

Yamazaki et al. (5,970,384) teach a method for the fabrication of a field-effect transistor comprising the steps of: forming a semiconductor layer **704** serving as an active layer on a substrate **701**; forming a stage gate insulating film **705** on the semiconductor layer; heat treating the gate insulating film in an N_2O atmosphere (col. 15, lines 7-37) (Figure 7E, col. 12, lines 40-67). Yamazaki et al. (5,970,384) further teach the gate insulating film formed by plasma CVD method using a TEOS gas (col. 5, lines 45-58). However, Yamazaki et al. (5,970,384) fail to teach setting the substrate temperature at no higher than 100°C and heat-treating the gate insulating film in an atmosphere containing water. Grill et al. teach setting the substrate temperature at between about 25°C and about 400°C, which is in the range of no higher than or no less

than 100°C. (page 2, paragraph [0022]). Yamazaki et al. (US 2002/0034863 A1) teach heat-treating in an atmosphere containing water (page 13, paragraph [0269]). Since Yamazaki et al. (5,970,384), Grill et al. and Yamazaki et al. (US 2002/0034863 A1) are from the same field of endeavor (method of manufacturing semiconductors), the purpose disclosed by Yamazaki et al. (US 2002/0034863 A1) would have been recognized in the pertinent art of Yamazaki et al. (5,970,384) and Grill et al. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method for the fabrication of a field-effect transistor of Yamazaki et al. (5,970,384) by incorporating the substrate temperature of Grill et al. and the atmosphere containing water of Yamazaki et al. (US 2002/0034863 A1) to obtain a semiconductor device having an excellent performance (page 13, paragraphs [0269]-[0273]).

Claims 3-4 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. (5,970,384), Grill et al. (US 2002/0037442 A1) and Yamazaki et al. (US 2002/0034863 A1) as applied to claims 1 and 7-8 above, and further in view of An et al. (US 6,245,618 B1).

Yamazaki et al. (5,970,384), Grill et al. and Yamazaki et al. (US 2002/0034863 A1) teach all mentioned in the rejection above. However, Yamazaki et al. (5,970,384), Grill et al. and Yamazaki et al. (US 2002/0034863 A1) fail to teach conducting a process while cooling a substrate. An et al. teach conducting a process while cooling a substrate (col. 1, lines 46-56). Since Yamazaki et al. (5,970,384), Grill et al., Yamazaki

et al. (US 2002/0034863 A1) and An et al. are from the same field of endeavor (method of manufacturing semiconductors), the purpose disclosed by An et al. would have been recognized in the pertinent art of Yamazaki et al. (5,970,384), Grill et al. and Yamazaki et al. (US 2002/0034863 A1). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method for the fabrication of a field-effect transistor of Yamazaki et al. (5,970,384), the substrate temperature of Grill et al. and the atmosphere containing water of Yamazaki et al. (US 2002/0034863 A1) by incorporating cooling a substrate of An et al. to reduce junction leakage current (col. 1, lines 46-56).

Response to Arguments

Applicant's remarks filed 03-03-03 have been fully considered but they are not persuasive.

In response to the remarks concerning Grill et al., Grill et al. is not being relied upon for the multiphase film being deposited on the substrate. Grill et al. is being relied upon because it's a method of forming a semiconductor structure whose substrate temperature is set at a range of no higher than or no less than 100 degrees C. In regard to the substrate temperature, it is not inventive to point out a particular range of conditions or optimum working ranges if what is involved is nothing more than skill of mechanic and exercise of patient experimentation; pantentee simply cannot designate a range in a known process and maintian a monopoly on processes within that range on

the grounds that it produces optimum results. Duplan Corp. v. Derring Milliken, Inc., 444 F.Supp. 648 (D.C. S.C. 1977).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respects to a method for fabricating field effect transistors:

Ono (US 6,300,239 B1) Saito et al. (4,889,817)

Satake et al. (US 6,208,002 B1) Yamazaki et al. (US 6,261,877 B1).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ida M. Soward whose telephone number is 703-305-3308. The examiner can normally be reached on Monday - Thursday, 6:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ims
April 16, 2003

AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800